

**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:  
Vladimir I. Merkulov et al.

Serial No.: 09/795,660

Filed: February 27, 2001

For: CARBON TIPS WITH EXPANDED  
BASES

Group Art Unit: 2812

Examiner: Unknown

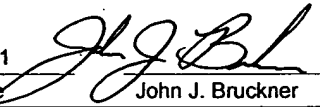
Atty. Dkt. No.: UBAT:027US/JJB

**CERTIFICATE OF MAILING  
37 C.F.R. 1.8**

I hereby certify that this correspondence is being deposited with the U.S. Postal Service with sufficient postage as First Class Mail in an envelope addressed to: Commissioner for Patents, Washington, DC 20231, on the date below:

July 18, 2001

Date

  
John J. Bruckner

**INFORMATION DISCLOSURE STATEMENT**

Commissioner for Patents  
Washington, D.C. 20231

Sir:

In compliance with the duty of disclosure under 37 C.F.R. § 1.56, it is respectfully requested that this Information Disclosure Statement be entered and the documents listed on attached Form PTO-1449 be considered by the Examiner and made of record. Copies of the listed documents required by 37 C.F.R. § 1.98(a)(2) are enclosed for the convenience of the Examiner.

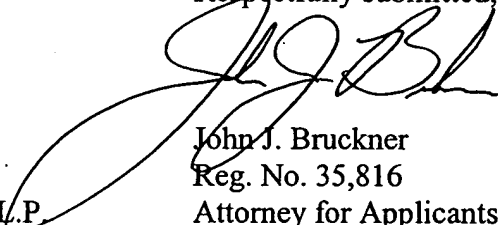
In accordance with 37 C.F.R §§ 1.97(g), (h), this Information Disclosure Statement is not to be construed as a representation that a search has been made, and is not to be construed to be

an admission that the information cited is, or is considered to be, material to patentability as defined in 37 C.F.R. § 1.56(b).

The present Information Disclosure Statement is being filed prior to the receipt of a first Official Action reflecting an examination on the merits, and hence is believed to be timely filed in accordance with 37 C.F.R § 1.97(b). No fees are believed to be due in connection with the filing of this Information Disclosure Statement, however, should any fees under 37 C.F.R. §§ 1.16 to 1.21 be deemed necessary for any reason relating to these materials, the Commissioner is hereby authorized to deduct said fees from Fulbright & Jaworski Deposit Account No.: 50-1212/10100920/JJB.

Applicants respectfully request that the listed documents be made of record in the present case.

Respectfully submitted,



John J. Bruckner  
Reg. No. 35,816  
Attorney for Applicants

FULBRIGHT & JAWORSKI L.L.P.  
600 Congress Avenue, Suite 2400  
Austin, Texas 78701  
(512) 474-5201

Date: July 18, 2001

Form PTO-1449 (modified)	Atty. Docket No. UBAT:027US/JJB	Serial No. 09/795,660
List of Patents and Publications for Applicant's  INFORMATION DISCLOSURE STATEMENT  (Use several sheets if necessary)	Applicant Vladimir I. Merkulov <i>et al.</i>	
	Filing Date: February 27, 2001	Group: 2812
U.S. Patent Documents <i>See Page 1</i>	Foreign Patent Documents <i>See Page 1</i>	Other Art <i>See Page 1</i>

### U.S. Patent Documents

Exam. Init.	Ref. Des.	Document Number	Date	Name	Class	Sub Class	Filing Date of App.

### Foreign Patent Documents

Exam. Init.	Ref. Des.	Document Number	Date	Country	Class	Sub Class	Translation Yes/No

### Other Art (Including Author, Title, Date Pertinent Pages, Etc.)

Exam. Init.	Ref. Des.	Citation
	C1	Baker, "Catalytic growth of carbon filaments," <i>Carbon</i> , 27:315-323, 1989.
	C2	Merkulov <i>et al.</i> , "Patterned growth of individual and multiple vertically aligned carbon nanofibers," <i>Applied Physics Letters</i> , 76:3555-3557, 2000.
	C3	Ren <i>et al.</i> , "Growth of a single freestanding multiwall carbon nanotube on each nanonickel dot," <i>Applied Physics Letters</i> , 75:1086-1088, 1999.
	C4	Ren <i>et al.</i> , "Synthesis of large arrays of well-aligned carbon nanotubes on glass," <i>Science</i> , 282:1105-1107, 1998.

25053124.1

EXAMINER:

DATE CONSIDERED:

EXAMINER: INITIAL IF REFERENCE CONSIDERED, WHETHER OR NOT CITATION IS IN CONFORMANCE WITH MPEP609; DRAW LINE THROUGH CITATION IF NOT IN CONFORMANCE AND NOT CONSIDERED. INCLUDE COPY OF THIS FORM WITH NEXT COMMUNICATION TO APPLICANT.

INFORMATION DISCLOSURE STATEMENT — PTO-1449 (MODIFIED)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANTS</b>	Atty. Docket No. <b>UBAT1310</b>
Applicants <b>Vladimir I. Merkulov, et al.</b>	
Application Number <b>09/795,660</b>	Filed <b>02/27/02</b>
For <b>Carbon Tips with Expanded Bases</b>	
Group Art Unit <b>2812</b>	Examiner <b>Unknown</b>
Confirmation No. <b>6123</b>	

**Box Patent Application**

Assistant Commissioner for Patents  
Washington, D.C. 20231

**Certification Under 37 C.F.R. §1.8**

I hereby certify that this document is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231 on **October 18, 2002.**

  
Janice Pampell

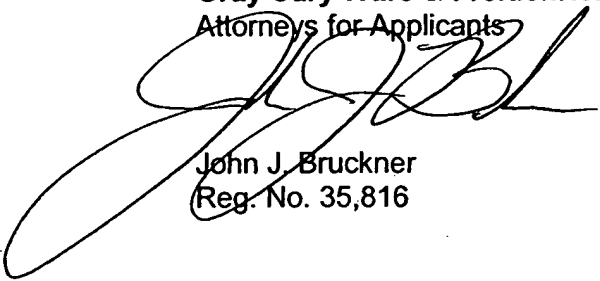
Applicants respectfully request, pursuant to 37 C.F.R. §§ 1.56, 1.97 and 1.98, that the art listed on the attached PTO-1449 form be considered and cited in the examination of the above-identified application. A copy of the art is enclosed for the convenience of the Examiner. Furthermore, pursuant to 37 C.F.R. §§ 1.97(g) and (h), no representation is made that a search has been made or that this art is material to patentability of the present application. Applicants respectfully submit that the claims of Applicants' above-referenced patent application are patentably distinguishable from these references.

Applicants hereby state under 37 C.F.R. § 1.97 (e)(1) that each item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the present statement, as evidence by the date of the enclosed search report.

If any fees are inadvertently omitted or if any amounts have been overpaid, please appropriately charge or credit those fees to Deposit Account No. 50-0456 of Gray Cary Ware & Freidenrich, LLP.

Respectfully submitted,

**Gray Cary Ware & Freidenrich LLP**  
Attorneys for Applicants



John J. Bruckner  
Reg. No. 35,816

Dated: October 18, 2002

1221 S. MoPac Expressway, Suite 400  
Austin, Texas 78746  
Tel. (512) 457-7233  
Fax. (512) 457-7001

FORM PTO 1449 US Department of Commerce Patent and Trademark Office	ATTY DOCKET NO.: <b>UBAT1310</b>	APPLICATION NO.: <b>09/795,660</b>
	APPLICANT(S): <b>Vladimir I. Merkulov, et al.</b>	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>	FILING DATE: <b>02/27/01</b>	GROUP ART UNIT: <b>2812</b>

#### U.S. PATENT DOCUMENTS

EXAM. INITIALS		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB- CLASS	FILING DATE
	A1	5,804,910	09/08/98	Kevin Tjaden, et al.	313	310	01/18/96
	A2	6,417,606	07/09/02	Masayuki Nakammoto, et al.	313	336	10/08/99
	A3						
	A4						

#### FOREIGN PATENT DOCUMENTS


EXAM. INITIALS		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB- CLASS	TRANSLATION (YES/NO)
	B1						
	B2						
	B3						
	B4						

#### OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages)

	C1	PCT International Search Report Date Mailed September 17, 2002.
	C2	<i>Synthesis of Large Arrays of Well-Aligned Carbon Nanotubes on Glass</i> by Z.F. Ren, et al. SCIENCE Vo. 282, November 6, 1998
	C3	<i>Variations in Structure and Emission Characteristics of Nanostructured Carbon Films Prepared by HFCVD Method Due to the Addition of Ammonia in Source Gases</i> , by Seungho Choi, et al. Dept. of Molecular Science and Technology, Ajou University, Suwon 442-749 Korea. 2001 IEEE
	C4	

EXAMINER	DATE CONSIDERED
----------	-----------------

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<b>IN THE UNITED STATES PATENT AND TRADEMARK OFFICE</b>	
<b>SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT</b>	Atty. Docket No. <b>UBAT1310</b>
Applicant <b>Vladimir Merkulov, et al.</b>	
Application Number <b>09/795660</b>	Filed <b>February 27, 2001</b>
For <b>CARBON TIPS WITH EXPANDED BASES</b>	
Group Art Unit <b>2812</b>	Examiner <b>Unknown</b>
<p style="text-align: center;"><u>Certificate of Mailing Under 37 C.F.R. 1.8</u></p> <p>I hereby certify that this correspondence is being deposited with the U.S. Postal Service as First Class Mail in an envelope addressed to: Asst. Commissioner for Patents, Washington, D.C. 20231 on <u>9-26-</u>, 2002.</p> <p style="text-align: center;"> Janice Pampell</p>	

Commissioner for Patents  
Washington, D.C. 20231

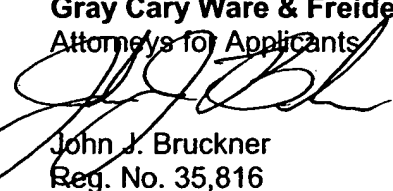
Dear Sir:

Applicant respectfully requests, pursuant to 37 C.F.R. §§ 1.56, 1.97 and 1.98, that the art listed on the attached PTO-1449 form be considered and cited in the examination of the above-identified application. A copy of the art is enclosed for the convenience of the Examiner. Furthermore, pursuant to 37 C.F.R. §§ 1.97(g) and (h), no representation is made that a search has been made or that this art is material to the patentability of the present application.

If any fees are inadvertently omitted, or if any additional fees are required, or if any amounts have been overpaid, please appropriately charge or credit those fees to Deposit Account No. 50-0456 of Gray Cary Ware & Freidenrich, LLP.

Respectfully submitted,

**Gray Cary Ware & Freidenrich LLP**  
Attorneys for Applicants

  
John J. Bruckner  
Reg. No. 35,816

Dated: Sept 24, 2002  
1221 South MoPac Expressway  
Suite 400  
Austin, TX 78746-6875  
Tel. (512) 457-7233  
Fax. (512) 457-7001

<b>FORM PTO 1449 US Department of Commerce Patent and Trademark Office</b>			Application Number		09/795660	
			Filing Date		February 27, 2001	
			First Named Inventor		Vladimir Merkulov, et al.	
			Group Art Unit		2812	
			Examiner Name		Unknown	
Sheet	1	of	1	Attorney Docket Number		UBAT1310
Examiner Initials	Cite No.	<b>OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS</b>				Date
	C1	Guillom, et al., "Operation of a gated field emitter using an individual carbon nanofiber cathode," Applied Physics Letters, Vol. 79, No. 21, pp. 3506-3508.				November 19, 2001
	C2	Baylor, et al., "Field emission from isolated individual vertically aligned carbon nanocones" Journal of Applied Physics, Vol. 91, No. 7, pp. 4602-4606.				April 1, 2002
	C3	Saito et al., "Field Emission Patterns from Single-Walled Carbon Nanotubes," Japan Journal Applied Physics, Vol. 36, pp. 1340-1342.				October 1, 1997
	C4	Matsumoto, et al., "Ultralow biased field emitter using single-wall carbon nanotube directly grown onto silicon tip by thermal chemical vapor deposition," Applied Physics Letters, Vol. 78, No. 4, pp. 539-540.				January 22, 2001
	C5	Guillom, et al., "Fabrication of gated cathode structures using an <i>in situ</i> grown vertically aligned carbon nanofiber as a field emission element", Journal of Vacuum Science, pp. 573-578.				Mar/Apr. 2001
	C6	Rinzler, et al., "Unraveling Nanotubes: Field Emission from an Atomic Wire" available at <a href="http://www.jstor.org">www.jstor.org</a> , pp. 1550-1553.				May 9, 2002
	C7	Merkulov, et al., "Patterned growth of individual and multiple vertically aligned carbon nanofibers," Applied Physics Letters, Vol. 76, No. 24, pp. 3555-3557.				June 12, 2000
	C8	Xueping, et al., "A method for fabricating large-area, patterned, carbon nanotube field emitters," Applied Physics Letters, Vol. 74, No. 17, pp. 2549-2551.				April 26, 1999
	C9	Merkulov, et al., "Scanned-probe field-emission studies of vertically aligned carbon nanofibers" Journal of Applied Physics, Vol. 89, No. 3, pp. 1933-1937.				February 1, 2001
	C10	Bonard, et al., "Field emission from single-wall carbon nanotube films" Applied Physics Letters, Vol. 73, No. 7, pp. 918-920				August 17, 1998
	C11	Xueping, et al., "Carbon Nanotube-based vacuum microelectronic gated cathode," Material Research Society Symposium, Vol. 509, pp. 107-109.				1998
	C12	Dean, et al., "The environmental stability of field emission from single-walled carbon nanotubes" Applied Physics Letters, Vol. 75, No. 19, pp. 3017-3019.				November 8, 1999
	C13	Wang, et al., "Flat panel display prototype using gated carbon nanotube field emitters," Applied Physics Letters, Vol. 78, No. 9, pp. 1294-1296.				February 26, 2001
	C14	Lee, et al., "Realization of Gated Field Emitters for Electrophotonic Applications Using Carbon Nanotube Line Emitters Directly Grown into Submicrometer Holes," Advanced Materials Communications, Vol. 13, No. 7, pp. 479-482.				April 4, 2001
	C15	Guillom, et al. "Microfabricated field emission devices using carbon nanofibers as cathode elements", Journal of Vacuum Science Technology B19(6), pp. 2598-2601.				Nov/Dec. 2001
Examiner Signature					Date Considered	